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ABSTRACT

In order to investigate the hypothesis that the conceptualization of sequence precedes that of simultaneity in child development, and to explore the use of elicited imitation in studying lexical acquisition, 32 subjects between 3 and 5 years of age were asked to verbally imitate a list of sentences. The constructions combined simple and reverse sequentiality and simultaneity, and responses were ranked by their correctness. The data suggest that children acquire reference to time first by simple sequentiality, then by reversal of event order with the appropriate sentence construction, and last by simultaneity. The use of verbal imitation of some complexity may also be a valuable instrument in the study of child language. Further investigation into the child's use of meanings together with semantic strategies is indicated. (MSE)

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The Expression of Time in Language Acquisition

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The Expression of Time in Language Acquisition

Recent psycholinguistic research has been concerned with the ways in which children assign meanings to words. Studies of spontaneous speech and tests of comprehension and production have revealed much about the development of word meaning (Clark, 1971;1973b). Yet verbal imitation tests have rarely been used to explore the acquisition of the lexicon.

One purpose of this investigation was to explore the use of elicited imitation in studying lexical acquisition. It was assumed that once the child must imitate model sentences which exceed short term memory, imitations will deform the sentences in agreement with the child's linguistic system. This is supported by Slobin and Welsh(1973).

In the present investigation elicited imitation was used to examine the acquisition of linguistic structures which temporally relate two independent events. The research discussed here is part of a larger study which tests the hypothesis that the child learns to express sequence, as in before and after prior to simultaneity, as in at the same time and while.

A review of previous investigations reveals no disagreement over the meaning of sequence: all investigators operationalized it as two independent events which occur in succession. The concept of simultaneity, however, has been given varied interpretations in the literature. Clark (1970;1971) considers simultaneity to be 'time at which X'. Here two

different events are not temporally related, rather one event is marked in time. In this view the child's use of today and now marks simultaneity. The present investigation instead, considers the acquisition of simultaneity in terms of the child's ability to relate two spatially distinct events. In that view simultaneity is 'time at which X and Y'.

The hypothesis that sequence should precede simultaneity is suggested by a range of data. Piaget(1969) found children under 5 years unable to conceive of two distinct events as simultaneous. Apparently the difference in end points of two distinct events led the child to think there were two different actions, hence two different times.

Similarly, it has often been observed that young children tend to focus on one part of an event or one event of two(Piaget, 1969). The fixation on one event, then fixation of another results in the sequential processing, hence sequential representation of the two events. This would suggest that at first the child may organize two events sequentially whether they occur at the same or different times.

In order to investigate the hypothesis that sequence precedes simultaneity thirty-two subjects between 3 and 5 years were asked to verbally imitate a list of sentences. Each list contained 8 constructions repeated twice, for a total of 16 sentences. (The subject groups and the mean age in each group appear at the top of your handout—see attached.) (Examples of the constructions appear below on the handout.) The first four constructions represent what I have called SIMPLE SEQUENTIALITY—

where the clause order is the same as the temporal order of the events described in the clauses. Sentences 5 and 6 represent what I call REVERSE SEQUENTIALITY, where the clause order is the reverse of the temporal order of the events described in the clauses. Sentences 7 and 8 represent SIMULTANEITY where the clause order does not correspond in any way to the temporal order.)

Each imitation response was ranked on a scale from 1 - 7, from nothing imitated correctly to perfect imitations.

An analysis of variance revealed a main effect for age, and for temporal construction, significant at the .005 level. In addition scores of simple sequentiality were significantly higher than on reverse sequentiality also at .005. Likewise, scores on reverse sequentiality were significantly higher than on simultaneity at .05 level. These results suggest that sequence is acquired before simultaneity when we speak of two spatially distinct events.

As previous studies have shown, children's response errors reveal much about the way children understand and use temporal constructions. Johnson(1972) observed two error patterns when children were asked to act out sentences expressing sequence. They either acted out the clauses in reverse of their correct order (a reversal error) or they acted out only one clause (an omission error). Johnson suggested that reversals reflect some comprehension of a temporal relation between two events whereas omissions do not indicate that the child perceives any temporal relation between two events.

This observation can be extended to the present data. Two error patterns were evident in imitations of sentences expressing simultaneity. Children either omitted the temporal construction or substituted one temporal word for another. If a child imitated 9a,[1] as 9b, we have no clear evidence that the child conceives of the two events as temporally related. However, if 9a, is imitated as 9c, it minimally suggests that the child has temporally conncected two events. It was hypothesized, therefore, that there would be more omissions in imitations of simultaneity than in imitations of sequence. This was confirmed at the .005 level.

One can also make predictions about substitution responses in verbal imitation. A number of investigators (Donaldson and Wales, 1970; Campbell and Wales, 1970; Clark, 1972) found that children first acquire the unmarked or more general member of a pair of polar adjectives. The unmarked member refers both to the domain in general—for example 'how big is it' and to the end with greatest extent—'it's big'. I will call the unmarked member the more functional member of the pair. This suggests that the more functional the word is the more likely it is to be acquired first.

In the present investigation it was expected that if a child was in the process of acquiring reference to a particular temporal relation, the more unrestricted, more functional word in that domain would be used first. The youngest children, Group I, displayed this in their imitations of sentences expressing simultaneity. Sentences with <u>while</u> were frequently

[1]See attached pages for examples 9-19

imitated with and. That is 10a was imitated as 10b. This imitation pattern suggests that at best, while is understood as referring to the temporal domain; at worst it is not understood at all.

In Group II connectives referring to sequence were substituted for while—for example, and then, before, and after. Even in Group IV children continued to make some substitutions for while. However, at that time when was most frequently substituted for while. The substitution of a synonymous word for while suggests growing acquisition of the meaning of while.

Imitations of sentences with at the same time like sentence 11 revealed somewhat different but not conflicting results. The most dominant error in children from 3 to 4 years was omission of the entire phrase at the same time. By 5 years 38% of the imitations of at the same time were still omissions. The omission error suggests that the children do not associate at the same time with the simultaneity of two different events.

An alternative explanation could be offered for the omission of at the same time. Since at the same time appears at the end of the stimulus sentence used, it could be argued that the children displayed poor recall for later presented material. If this were the case, one might expect more errors in the second clause of the other stimulus sentences than in the first clause. Error frequencies in the first versus the second clause of those sentences were compared. There were significantly more errors in the

first clause of the remaining stimulus sentences than in the second clause. Using a two-tailed test this difference was significant as .001. This argues against errors in sentences with at the same time due to inferior recall for later presented material. As suggested earlier, the acquisition of sequence before simultaneity must be due to other factors.

The data on simultaneity argue that children do not yet have productive use of simultaneity as it was operationalized as at the same time and while.

Specific error patterns also reveal the acquisition order of words referring to sequence. The youngest children, Group I, frequently omitted words expressing sequence in their imitations, indicating the lack of full acquisition of reference to sequence.

In Group II's responses we begin to see the gradual differentiation of the lexical items expressing sequence. Sentences with first and last were imitated as First clause 1 and then clause 2. That is, 12a was imitated as 12b.

Errors in imitations of before or of after were almost entirely substitutions of before for after or after for before or the same conjunction in one clause rather than the other.

13a was imitated as 13b or 13c. 14a was imitated as 14b or 14c. 15a was imitated as 15b. 16a was imitated as 16b or 16c.

In these responses, that is, Group II's imitations of sentences with before and after, the children seemed to be testing hypotheses by asking a number of questions: First, what are the possible positions of a

conjunction in a sentence? This is reflected in the children's alternation in imitating the conjunctions in either sentence initial or inter-clause position. Second, how is the meaning of the sentence changed if before is used, if after is used? As shown by the alternation between before and after in the children's imitations, it appeared that the Group II children were not yet certain which member of the before-after pair referred to prior events and which to subsequent events. Third, can two conjunctions be used in a two clause sentence? Evidence of this is imitation response 14c.

The most critical error pattern in Group II was in the imitation of sentence type 6, C_2 after C_1. Over 60% of the imitations of this construction were incorrect as shown in 16b and c. This strongly suggests that after, used to describe events in reverse of their order of occurrence as in C_2 after C_1, is the last acquired of the before-after constructions. This imitation response pattern is in agreement with Clark's comprehension findings(1971).

Interestingly, the acquisition of simultaneity is reflected in Group III's imitations of sentences expressing sequence. For the first time in these data, we find conjunctions expressing sequence imitated as conjunctions expressing simultaneity. Sentences with before and after were sometimes imitated as while or when. 17a was imitated as 17b. The apparent over-generalization of a form under acquisition has been observed elsewhere. Brown(1973) reports frequent over-generalization of the past tense morpheme -ed, for instance, even after the irregular past tense forms have been in use. While these data and Brown's do not reflect exactly the same phenomenon,

there is some similarity in the process of over-generalization.

Group IV made few errors in imitating sentences expressing sequentiality with the exception of sentence type 6- C_2 after C_1. This adds further credence to the claim that this is the last construction to be acquired in the before-after pair.

These results are difficult to predict on syntactic grounds alone, since before, after and while are syntactically similar. For example, these three conjunctions are all proverbalized as do + Tns as in sentence 18.

In addition, the object of the verb in these clauses cannot be questions or relativized as in 19b and c.

Such notions as derivational complexity (derivational simplicity-Clark,1973a) fail to account for the results since sentence type 1- C_1 before C_2 and type 8- C_1 while C_2 share similar transformational histories. Similarly, at the same time can be viewed as a specified coordinate clause which, according to some views, ought to be acquired before subordinate clause constructions.

This research indicates that children acquire reference to time in the following order. They first learn to use and understand constructions which describe two different sequential events in their order of occurrence. Next they begin to represent and express two different sequential events in reverse of their order of occurrence. Last they acquire reference to two different events which occur simultaneously. We are currently investigating when the acquisition of the sequence and

simultaneity of two identical events is acquired. Those data should fill in the lacuna in the present investigation.

This study also suggests that tests of verbal imitation can provide insight into the child's linguistic system if the sentences are long enough so that rote repetition is not possible. The many correspondences between these data and results from comprehension tests reported elsewhere indicate that verbal imitation may be a more valuable instrument for measuring linguistic competence than had previously been thought.

The data cited here also suggest that the gradual differentiation of lexical items may be more complex than previous formalisms have indicated. I would argue that existing formal notation has exhibited an inability to capture important observations. That is, in the acquisition of lexical items children display growing knowledge of not only meaning components, but they also give evidence of using strategies or operating principles to test hypotheses about both word order and word meaning. For example, Group II alternated between imitating before as after and after as before. This indicates some knowledge that these words refer to sequence, evidence of the acquisition of a component that we might describe as sequence.

Evidence of an operating principle can also be found in Group II's imitations of before and after in different positions in the sentences. The principle might be: If a word is a conjunction, it can appear in sentence initial or inter-clause position.

One type of strategy involves testing the meaning of a word under acquisition. We saw that the younger groups first imitate while as and;

later they imitated while as before, after, and and then.

The children can be described as following a two stage strategy.

Stage 1: If the meaning of a word in a particular domain is not known, see if it has the most functional, least restricted meaning. This strategy accounts for substitutions of and in place of before, after and while.

Stage 2: Once it has been determined that the meaning of word X is not the same as the most functional word in that domain, see if word X shares certain meaning components with lexical items with which I am more familiar. This strategy described the substitution of before and after for while and the substitution of and then for last.

These data argue for analyses which include information both about which meaning components the child has assigned to a word and about the operating principles or strategies the child gives evidence of using. The data presented here coupled with more recent work(Clark and Garnica, 1974; Kuczaj and Maratsos, 1974) suggest that we may be moving away from the constraints imposed by different notational systems and toward a rich, more complete description of the acquisition process.

Subject Age Groups

	mean age
I	3;2
II	4;0
III	4;5
IV	4;10

Simple Sequentiality: where the clause order is the same as the temporal order

1)	C_1 before C_2.	The girl pet the mouse before the boy kicked the car.
2)	After C_1 C_2.	After the boy hopped over the dog, the girl pushed the cat.
3)	First C_1. Last C_2.	First the girl pushed the mouse. Last the boy kicked the car.
4)	C_1 and then C_2.	The boy hopped over the shoe and then the girl pushed the dog.

Reverse Sequentiality: where the clause order is the reverse of the temporal order

5)	Before C_2 C_1.	Before the girl hit the cat the boy jumped over the cup.
6)	C_2 after C_1.	The boy pushed the box after the girl threw the flower.

Simultaneity: where the clause order does not correspond in any way to the temporal order

7)	C_1 and C_2 at the same.	The girl hopped over the cup and the boy pushed the cat at the same time.
8)	C_1 while C_2.	The boy kissed the elephant while the girl pulled the car.

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9) a. C_1 while C_2

b. C_1 C_2.

c. C_1 before C_2.

10) a. C_1 while C_2.

b. C_1 and C_2.

11) The boy kissed the dog and the girl pet the cat at the same time.

12) a. First C_1. Last C_2.

b. First C_1 and then C_2.

13) a. C_1 before C_2.

b. Before C_2 C_1.

14) a. Before C_2 C_1.

b. C_2 and C_1.

c. Before C_2 before C_1.

15) a. After C_1 C_2.

b. Before C_1 C_2.

16) a. C_2 after C_1.

b. Before C_2 C_1.

c. After C_2 C_1.

17) a. $C_1 \left\{ \begin{matrix} \text{before} \\ \text{after} \end{matrix} \right\} C_2$.

b. $C_1 \left\{ \begin{matrix} \text{while} \\ \text{when} \end{matrix} \right\} C_2$.

18) He came $\left\{ \begin{matrix} \text{before} \\ \text{after} \\ \text{while} \end{matrix} \right\}$ she did so.

19) a. She fainted before he bought the car.

*b. What did she faint before he bought?

*c. The car which she fainted before he bought was new.

BIBLIOGRAPHY

Brown, R. (1973) A first language: The early stages Cambridge, Mass: Harvard University Press.

Campbell, R. and Wales, R. (1970) "The study of language acquisition." In Lyons, J. (Ed.) New horizons in linguistics. England: Penguin Books, 242-260.

Clark, E. (1970) "How young children describe events in time." In Flores d' Arcais, G. B. and Levelt, W. J. M. (Eds.). Advances in psycholinguistics. Amsterdam: North Holland, 275-284.

_____ (1971) "On the acquisition of the meaning of before and after. JVLVB, 10:266-275.

_____ (1972) "On the child's acquisition of antonyms in two semantic fields." JVLVB, 11:750-758.

_____ (1973a) "How children describe time and order." In Ferguson, C. and Slobin, D. Studies of child language development. N. Y.: Holt, Rinehart and Winston, 585-606.

_____ (1973b) "Non-linguistic strategies and the acquisition of word meanings." Cognition, 2(2):161-182.

_____ and Garnica, O. K. (1974) "Is he coming or going? On the acquisition of deictic verbs" JVLVB, 13/5: 559-572.

Donaldson, M. and Wales, R. J. (1970) "On the acquisition of some relational terms." In Hayes, J. R. (Ed.) Cognition and the development of language. N. Y.: Wiley, 235-268.

Johnson, H. (1972) Untitled manuscript.

Kuczaj, S. and Maratsos, M. (1974) "Front, back, and side: Stages of acquisition. In Clark, E. V. (Ed.) Papers and reports on child language development: Sixth child language research forum. No. 8: 111-128.

Piaget, J. (1969) The child's conception of time. N. Y.: Ballantine Books.

Slobin, D. and Welsh, C. (1973) "Elicited imitation as a research tool in developmental psycholinguistics" In Ferguson, C. and Slobin, D. (Eds.) Studies of child language development. N. Y.: Holt, Rinehart and Winston, 485-497.